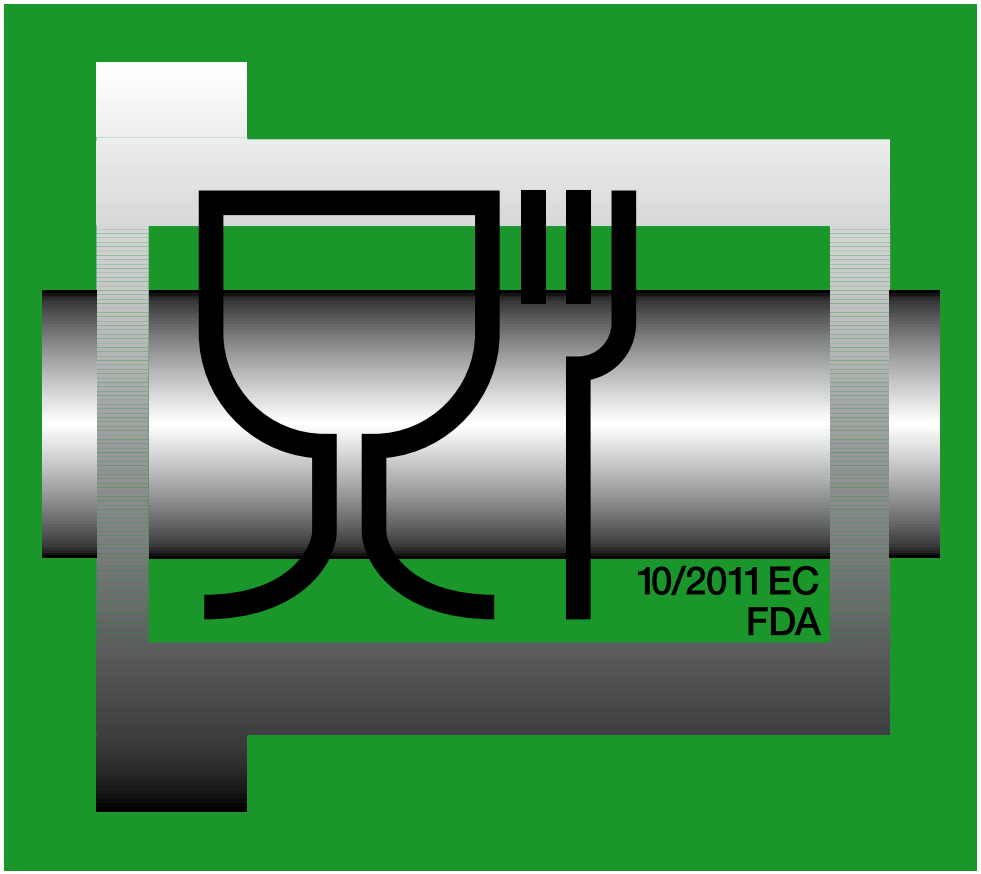
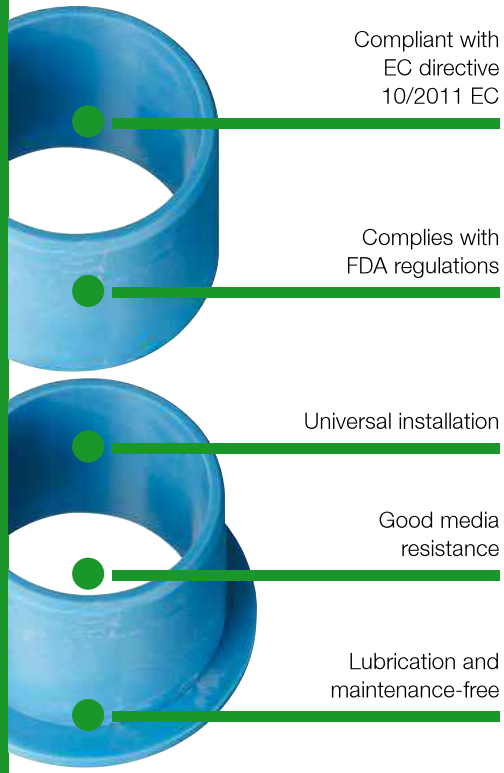


The universal bearing for contact with food – iglidur® A181

- Compliant with EC directive 10/2011 EC
- FDA-compliant
- Universal installation
- Good media-resistance
- Wear-resistant
- Lubrication and maintenance-free
- Standard range from stock

iglidur® A181 | The universal bearing for contact with food

FDA- and EC10/2011 compliant



The iglidur® A181 material is food compliant with directive 10/2011 EC and also to FDA specifications. The blue colour also facilitates the often required "optical detectability" in the food industry.

When to use it?

- When FDA-compliance is required
- When a material compliant with the 10/2011 EC is required
- When an universal material suitable for direct contact with food is required

When not to use it?

- When FDA and 10/2011 EC directive compliance are not required
  ▶ iglidur® J, page 141
- When temperatures are continuously greater than +90 °C
  ▶ iglidur® A350, page 347
- When a cost-effective universal bearing is required
  ▶ iglidur® G, page 79
  ▶ iglidur® P, page 113

Typical application areas

- Food industry
- Beverage technology
- Medical technology

Available from stock
Detailed information about delivery time online.

Block pricing online
No minimum order value. From batch size 1.

Max. +90 °C
Min. –50 °C

Ø 4–50 mm
More dimensions upon request

Imperial dimensions available
▶ From page 1391

Online product finder
▶ www.igus.eu/iglidur-finder

iglidur® A181 material complies with EC Directive 10/2011 EC and also with FDA (Food and Drug Administration) specifications for repeated contact with food.

iglidur® A181 | Technical data

Material properties

General properties	Unit	iglidur® A181	Testing method
Density	g/cm³	1.38	
Colour		blue	
Max. moisture absorption at +23 °C/50 % r.h.	% weight	0.2	DIN 53495
Max. water absorption	% weight	1.3	
Coefficient of sliding friction, dynamic, against steel	µ	0.10–0.21	
pv value, max. (dry)	MPa · m/s	0.31	
Mechanical properties			
Flexural modulus	MPa	1,913	DIN 53457
Flexural strength at +20 °C	MPa	48	DIN 53452
Compressive strength	MPa	60	
Max. recommended surface pressure (+20 °C)	MPa	31	
Shore-D hardness		76	DIN 53505
Physical and thermal properties			
Max. long-term application temperature	°C	+90	
Max. short-term application temperature	°C	+110	
Min. long-term application temperature	°C	–50	
Heat conductivity	W/m · K	0.25	ASTM C 177
Coefficient of thermal expansion (at +23 °C)	$K^{-1} \cdot 10^{-5}$	11	DIN 53752
Electrical properties			
Specific contact resistance	Ωcm	> 10^{12}	DIN IEC 93
Surface resistance	Ω	> 10^{12}	DIN 53482

Table 01: Material properties table

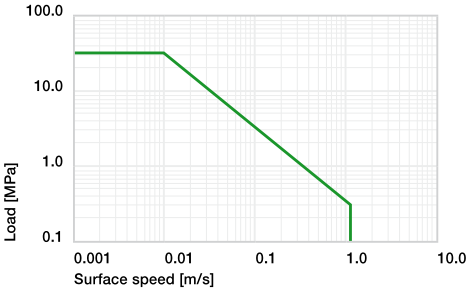


Diagram 01: Permissible pv values for iglidur® A181 bearings with a wall thickness of 1 mm dry running against a steel shaft, at +20 °C, mounted in a steel housing

Moisture absorption

The moisture absorption of iglidur® A181 plain bearings is approximately 0.2 % weight in standard climatic conditions. The saturation limit submerged in water is 1.3 % weight. This must be taken into account for these types of applications.

▶ Diagram, www.igus.eu/a181-moisture

Vacuum

When used in a vacuum environment, the iglidur® A181 plain bearings release moisture as a vapour. Use in a vacuum environment is only possible with dehumidified bearings.

Radiation resistance

Plain bearings made from iglidur® A181 are resistant up to a radiation intensity of 2 · 10^2 Gy.

UV resistance

iglidur® A181 bearings are only conditionally resistant to UV radiation.

Medium	Resistance
Alcohol	+
Hydrocarbons	+
Greases, oils without additives	+
Fuels	+
Diluted acids	0 to –
Strong acids	–
Diluted alkalines	+
Strong alkalines	+ to 0

+ resistant 0 conditionally resistant – not resistant
All data given at room temperature [+20 °C]
Table 02: Chemical resistance

▶ Chemical table, **page 1478**

Due to their technical properties and their conformity with the relevant regulations, iglidur® A181 bearings are predestined for applications in food technology. Compared to iglidur® A180 with regard to the mechanical properties, temperature and media resistance, iglidur® A181 is more suitable with respect to the wear resistance in most cases.

Mechanical properties

With increasing temperatures, the compressive strength of iglidur® A181 plain bearings decreases. The permissible maximum surface pressure is a mechanical material parameter. No conclusions regarding the tribological properties can be drawn from this.

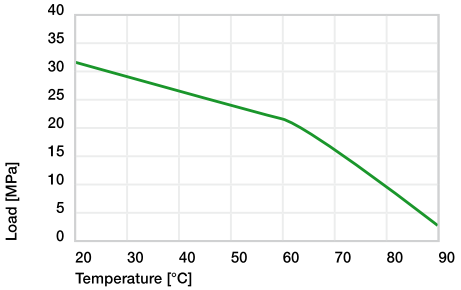


Diagram 02: Permissible maximum surface pressure of as a function of temperature (31 MPa at +20 °C)

Diagram 03 shows the elastic deformation of iglidur® A181 during radial loading.

▶ Surface pressure, **page 41**

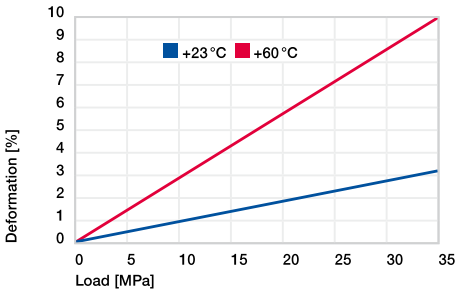


Diagram 03: Deformation under pressure and temperature

Permissible surface speeds

iglidur® A181 was developed for low surface speeds. Maximum speeds up to 0.8 m/s (rotating) and 3.5 m/s (linear) respectively are permitted for continuous application in dry operation. The given values in table 03 indicate the limits at which an increase up to the continuous permissible temperature occurs. This increase is a result of friction. In practice, though, this temperature level is rarely reached, due to varying application conditions.

▶ Surface speed, **page 44**
▶ pv value and lubrication, **page 86**

m/s	Rotating	Oscillating	Linear
Continuous	0.8	0.6	3.5
Short-term	1.2	1.0	5.0

Table 03: Maximum surface speeds

Temperatures

The long-term upper temperature limit of +90 °C permits the broad use in applications with direct contact with food. As shown in diagram 02, with increasing temperatures, the compressive strength decreases. When considering temperatures, the additional frictional heat in the bearing system must be taken into account. At temperatures over +60 °C an additional securing is required.

▶ Application temperatures, **page 49**
▶ Additional securing, **page 49**

Friction and wear

Coefficient of friction and wear resistance alter with the application parameters (diagrams 04 and 05). For iglidur® A181 bearings, the alteration of the coefficient of friction μ depends on surface speed and the shaft surface finish.

▶ Coefficients of friction and surfaces, **page 47**
▶ Wear resistance, **page 50**

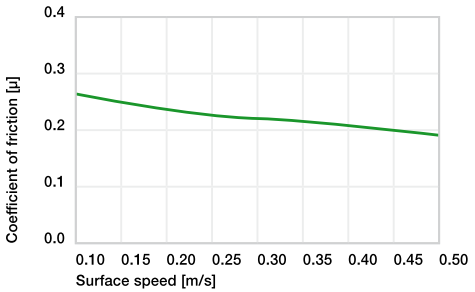


Diagram 04: Coefficient of friction as a function of the surface speed, p = 1.0 MPa

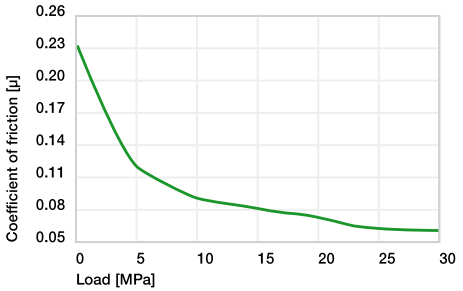


Diagram 05: Coefficient of friction as a function of the pressure, v = 0.01 m/s

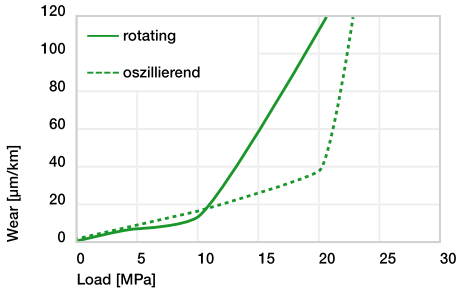


Diagram 07: Wear for oscillating and rotating applications with shaft material Cf53 hardened and ground steel, as a function of the pressure

Shaft materials

Diagram 06 shows results of testing different shaft materials with plain bearings made from iglidur® A181. Particular attention is paid in the food industry to the corrosion-resistant shaft types. Diagram 06 shows that very low wear rates can be achieved in combination with these shafts. As with many of the iglidur® materials, wear rate increases with otherwise identical parameters in rotation (Diagram 07).

▶ Shaft materials, **page 52**

iglidur® A181	Dry	Greases	Oil	Water
C. o. f. μ	0.10–0.21	0.08	0.03	0.04

Table 04: Coefficient of friction against steel (Ra = 1 µm, 50 HRC)

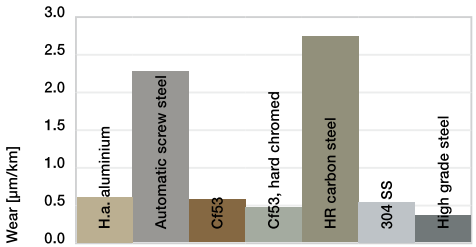


Diagram 06: Wear, rotating with different shaft materials, pressure, p = 1 MPa, v = 0.3 m/s

Installation tolerances

iglidur® A181 plain bearings are standard bearings for shafts with h-tolerance (recommended minimum h9). The bearings are designed for pressfit into a housing machined to a H7 tolerance. After being assembled into a nominal size housing, in standard cases the inner diameter automatically adjusts to the E10 tolerances.

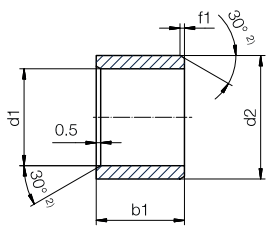
▶ Testing methods, **page 57**

Diameter d1 [mm]	Shaft h9 [mm]	iglidur® A181 E10 [mm]	Housing H7 [mm]
up to 3	0–0.025	+0.014 +0.054	0 +0.010
> 3 to 6	0–0.030	+0.020 +0.068	0 +0.012
> 6 to 10	0–0.036	+0.025 +0.083	0 +0.015
> 10 to 18	0–0.043	+0.032 +0.102	0 +0.018
> 18 to 30	0–0.052	+0.040 +0.124	0 +0.021
> 30 to 50	0–0.062	+0.050 +0.150	0 +0.025
> 50 to 80	0–0.074	+0.060 +0.180	0 +0.030
> 80 to 120	0–0.087	+0.072 +0.212	0 +0.035
>120 to 180	0–0.100	+0.085 +0.245	0 +0.040

Table 05: Important tolerances for plain bearings according to ISO 3547-1 after pressfit

iglidur® A181 | Product range

Sleeve bearing (Form S)



2) Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Order key

Type	Dimensions [mm]					
A181	S	M	-04	05	-04	
	iglidur® material	Form S	Metric	Inner-Ø d1	Outer-Ø d2	Length b1

Dimensions according to ISO 3547-1 and special dimensions

Imperial dimensions available
▶ From page 1398

Dimensions [mm]

d1	d1-Tolerance 3)	d2	b1 h13	Part No.
4.0	+0.020 +0.068	5.5	4.0	A181SM-0405-04
4.0		5.5	6.0	A181SM-0405-06
5.0		7.0	5.0	A181SM-0507-05
5.0		7.0	10.0	A181SM-0507-10
6.0		8.0	6.0	A181SM-0608-06
6.0		8.0	8.0	A181SM-0608-08
6.0		8.0	10.0	A181SM-0608-10
8.0	+0.025 +0.083	10.0	8.0	A181SM-0810-08
8.0		10.0	10.0	A181SM-0810-10
8.0		10.0	12.0	A181SM-0810-12
10.0		12.0	8.0	A181SM-1012-08
10.0		12.0	10.0	A181SM-1012-10
10.0		12.0	12.0	A181SM-1012-12
10.0		12.0	15.0	A181SM-1012-15
10.0		12.0	10.0	A181SM-1012-10
10.0		12.0	20.0	A181SM-1012-20
12.0	+0.032 +0.102	14.0	12.0	A181SM-1214-12
12.0		14.0	15.0	A181SM-1214-15
12.0		14.0	20.0	A181SM-1214-20
13.0		15.0	10.0	A181SM-1315-10
13.0		15.0	20.0	A181SM-1315-20
14.0		16.0	15.0	A181SM-1416-15
14.0		16.0	20.0	A181SM-1416-20
14.0		16.0	25.0	A181SM-1416-25
15.0		17.0	15.0	A181SM-1517-15
15.0		17.0	20.0	A181SM-1517-20
15.0		17.0	25.0	A181SM-1517-25
16.0		18.0	15.0	A181SM-1618-15
16.0	+0.032 +0.102	18.0	20.0	A181SM-1618-20
16.0		18.0	25.0	A181SM-1618-25
18.0		20.0	15.0	A181SM-1820-15
18.0		20.0	20.0	A181SM-1820-20
18.0		20.0	25.0	A181SM-1820-25
20.0	+0.040 +0.124	23.0	10.0	A181SM-2023-10
20.0		23.0	15.0	A181SM-2023-15
20.0		23.0	20.0	A181SM-2023-20
20.0		23.0	25.0	A181SM-2023-25
20.0		23.0	30.0	A181SM-2023-30
22.0		25.0	15.0	A181SM-2225-15
22.0		25.0	20.0	A181SM-2225-20
22.0		25.0	25.0	A181SM-2225-25
22.0		25.0	30.0	A181SM-2225-30
24.0		27.0	15.0	A181SM-2427-15
24.0		27.0	20.0	A181SM-2427-20
24.0		27.0	25.0	A181SM-2427-25
24.0		27.0	30.0	A181SM-2427-30
25.0		28.0	15.0	A181SM-2528-15
25.0		28.0	20.0	A181SM-2528-20
25.0		28.0	25.0	A181SM-2528-25
25.0		28.0	30.0	A181SM-2528-30
28.0		32.0	20.0	A181SM-2832-20
28.0		32.0	25.0	A181SM-2832-25
28.0		32.0	30.0	A181SM-2832-30
30.0		34.0	20.0	A181SM-3034-20
30.0		34.0	25.0	A181SM-3034-25
30.0		34.0	30.0	A181SM-3034-30

3) After press-fit. Testing methods ▶ Page 57

iglidur® A181 | Product range

Sleeve bearing (Form S)

A181SM

Dimensions [mm]

d1	d1-Tolerance 3)	d2	b1 h13	Part No.
30.0	+0.040 +0.124	34.0	40.0	A181SM-3034-40
32.0	+0.050 +0.150	36.0	20.0	A181SM-3236-20
32.0		36.0	30.0	A181SM-3236-30
32.0		36.0	40.0	A181SM-3236-40
35.0		39.0	20.0	A181SM-3539-20
35.0		39.0	30.0	A181SM-3539-30
35.0		39.0	40.0	A181SM-3539-40
35.0		39.0	50.0	A181SM-3539-50
40.0		44.0	20.0	A181SM-4044-20
40.0		44.0	30.0	A181SM-4044-30
40.0	+0.050 +0.150	44.0	40.0	A181SM-4044-40
40.0		44.0	50.0	A181SM-4044-50
45.0		50.0	20.0	A181SM-4550-20
45.0		50.0	30.0	A181SM-4550-30
45.0		50.0	40.0	A181SM-4550-40
45.0		50.0	50.0	A181SM-4550-50
50.0		55.0	20.0	A181SM-5055-20
50.0		55.0	30.0	A181SM-5055-30
50.0		55.0	40.0	A181SM-5055-40
50.0		55.0	50.0	A181SM-5055-50
50.0		55.0	60.0	A181SM-5055-60

3) After press-fit. Testing methods ▶ Page 57

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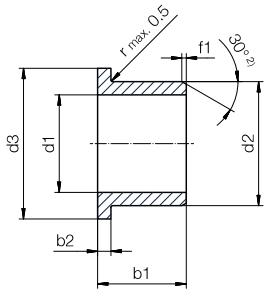
Do you need another length, other dimensions or tolerances? You need a particular design or alternative for your application? Please call us. igus® listens to your needs and provides you a solution very quickly.

Even more dimensions from stock
More than 300 dimensions are now available. Search online for your required bearing.
▶ www.igus.eu/iglidur-specialbearings

iglidur® A181 | Product range

Flange bearing (Form F)



[2] Thickness < 1 mm: chamfer = 20°

Chamfer in relation to the d1

d1 [mm]:	Ø 1–6	Ø 6–12	Ø 12–30	Ø > 30
f [mm]:	0.3	0.5	0.8	1.2

Order key

Type	Dimensions [mm]					
A181	F	M	-0608		-04	
iglidur® material	Form F	Metric	Inner-Ø d1	Outer-Ø d2	Length b1	

Dimensions according to ISO 3547-1 and special dimensions

Imperial dimensions available
▶ From page 1425

Dimensions [mm]

d1	d1- Tolerance[3]	d2	d3 d13	b1 h13	b2 –0.14	Part No.
6.0	+0.020 +0.068	8.0	12.0	4.0	1.0	A181FM-0608-04
6.0		8.0	12.0	6.0	1.0	A181FM-0608-06
6.0		8.0	12.0	8.0	1.0	A181FM-0608-06
8.0		10.0	15.0	5.5	1.0	A181FM-0810-05
8.0		10.0	15.0	7.5	1.0	A181FM-0810-07
8.0		10.0	15.0	9.5	1.0	A181FM-0810-09
8.0	+0.025 +0.083	10.0	15.0	10.0	1.0	A181FM-0810-10
10.0		12.0	18.0	7.0	1.0	A181FM-1012-07
10.0		12.0	18.0	9.0	1.0	A181FM-1012-09
10.0		12.0	18.0	10.0	1.0	A181FM-1012-10
10.0		12.0	18.0	12.0	1.0	A181FM-1012-12
10.0		12.0	18.0	17.0	1.0	A181FM-1012-17
12.0		14.0	20.0	7.0	1.0	A181FM-1214-07
12.0		14.0	20.0	9.0	1.0	A181FM-1214-09
12.0		14.0	20.0	12.0	1.0	A181FM-1214-12
12.0	+0.032	14.0	20.0	17.0	1.0	A181FM-1214-17
14.0	+0.102	16.0	22.0	12.0	1.0	A181FM-1416-12
14.0		16.0	22.0	17.0	1.0	A181FM-1416-17
15.0		17.0	23.0	9.0	1.0	A181FM-1517-09
15.0		17.0	23.0	12.0	1.0	A181FM-1517-12
15.0		17.0	23.0	17.0	1.0	A181FM-1517-17
16.0		18.0	24.0	12.0	1.0	A181FM-1618-12
16.0	+0.032	18.0	24.0	17.0	1.0	A181FM-1618-17
18.0	+0.102	20.0	26.0	12.0	1.0	A181FM-1820-12
18.0		20.0	26.0	17.0	1.0	A181FM-1820-17
18.0		20.0	26.0	22.0	1.0	A181FM-1820-22
20.0		23.0	30.0	11.5	1.5	A181FM-2023-11
20.0		23.0	30.0	16.5	1.5	A181FM-2023-16
20.0		23.0	30.0	21.5	1.5	A181FM-2023-21
25.0		28.0	35.0	11.5	1.5	A181FM-2528-11
25.0		28.0	35.0	16.5	1.5	A181FM-2528-16
25.0	+0.040 +0.124	28.0	35.0	21.5	1.5	A181FM-2528-21
30.0		34.0	42.0	16.0	2.0	A181FM-3034-16
30.0		34.0	42.0	26.0	2.0	A181FM-3034-26
35.0		39.0	47.0	16.0	2.0	A181FM-3539-16
35.0		39.0	47.0	26.0	2.0	A181FM-3539-26
40.0		44.0	52.0	30.0	2.0	A181FM-4044-30
40.0		44.0	52.0	40.0	2.0	A181FM-4044-40
45.0		50.0	58.0	50.0	2.0	A181FM-4550-50

[3] After press-fit. Testing methods ▶ Page 57

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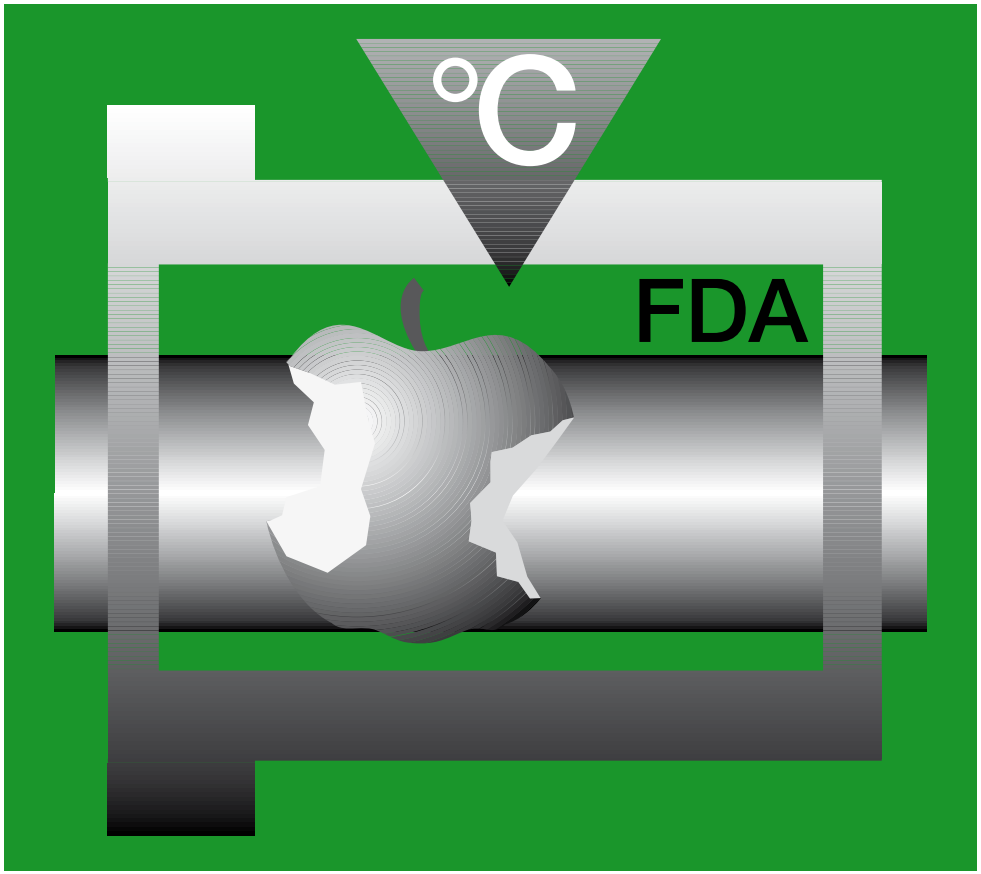

The endurance runner at higher temperatures in the food sector – iglidur® A350

- Compliant with EC directive 10/2011 EC
- FDA-compliant
- For use with temperatures up to +180 °C
- For medium and high loads
- Equally good for both oscillating and rotating applications
- Lubrication and maintenance-free
- Standard range from stock